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Publication date
2020
Document Version
Final published version
Published in
The astronomer's telegram

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*on **17 Mar 2020; 20:44 UT***
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Subjects: Radio, Neutron Star, Soft Gamma-ray Repeater, Transient, Pulsar, Magnetar

Referred to by ATel #: 13562, 13569, 13575, 13577, 13580, 13649, 13966, 14001

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On March 12, 2020, Swift/BAT detected a short burst from a new soft gamma-ray repeater, Swift J1818.0-1607 (GCN circular 27373). Following this burst, Enoto et al. (ATel #13551) uncovered a coherent periodicity of 1.36 s using NICER data in the 2-10 keV band. Detection of the periodicity suggested this new source to be a magnetar. Karuppusamy et al. (ATel #13553) reported discovery of radio pulsations at a dispersion measure (DM) of 706(4) cm^-3 pc, using the 100-m Effelsberg radio telescope at 1370 MHz.

Using the Robert C. Byrd Green Bank Telescope (GBT), we observed Swift J1818.0-1607 on March 17, 07:26 UT, with 800 MHz bandwidth around 2.0 GHz. We readily detected strong radio pulsations at a barycentric period of 1.36351 s, at a coherently dedispersed DM consistent with 706 cm^-3 pc. Assuming that the barycentric period measured by Enoto et al. was referenced to the start time of their observation on March 13, 01:38 UT, the period measured from our observations suggests a period-derivative of 9.3517(2)x10^-11. This measurement does not include the slightly larger uncertainty that is caused by the fact that the exact epoch of the X-ray periodicity measurement is not known. Using observations with Lovell and Effelsberg, Champion et al. (ATel #13559) have just reported perhaps a more precise period-derivative measurement of 8.16(2) x 10^-11. The spin-down rate is comparable to the Galactic center magnetar SGR J1745-2900 (Lynch et al. 2015), and further supports Swift J1818.0-1607 to be a magnetar. The spin-down rate measurement suggests the characteristic age of the magnetar to be less than 300 yrs, making it the youngest among the magnetars that are known to emit in radio.

The average profile at 2 GHz shows a faint component trailing the main peak by about 10% of the spin period, that is mostly comprised of intermittent, spiky emission. There was no hint of this

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component in the earlier observation reported at 1.37 GHz (ATel #13553). Data were calibrated for flux and polarisation based on standard radio sources. We find both pulse components are nearly 100% linearly polarized accompanied by a small degree of circular polarization. The mean flux density of the band-averaged profile is estimated to be about 0.05(1) mJy. Exploiting the large bandwidth, we also make a preliminary estimate of the spectral index to be -1.8(3). Extrapolating our 2 GHz flux density measurements to 1.4 GHz, and comparing with the March 14 discovery observations suggests that the magnetar's radio brightness might have decayed. However, the decrease might also be accounted for by rapid, intrinsic flux density variations which have been observed in other radio-loud magnetars.

The polarization profile and time-phase stack plots are available here:
http://alert.eu/Swift_J1818.0-1607/

We thank the Green Bank Observatory and staff for the prompt allocation and scheduling of our requested director's discretionary time, and their support.

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